AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions and listings of claims in the above-referenced application:

1   1.   (Currently amended)   A polaroid encoder system for detecting
2 movement, said system comprising:

3   a movable polarizing code element comprising a <u>first concentric</u> code
4 <u>extending over two of four quadrants of said movable polarizing code element and a</u>
5 <u>second concentric code extending over two of four quadrants of said movable</u>
6 <u>polarizing code segment, the first and second concentric codes juxtaposed one another</u>
7 <u>over one of the four quadrants of said movable polarizing code;</u>

8   a detector module to detect an amplitude based on how much illumination
9 passes through a first portion of said movable polarizing code element, said detector
10 module comprising:

11   a first illumination detector covered with a first static polarizing filter
12   that is oriented in a first direction

13   a second illumination detector covered with a second static polarizing
14   filter that is oriented in a second direction;

15   a first determination module to identify a quadrant of said movable polarizing
16 code element based on how much illumination passes through a second portion of said
17 movable polarizing code element, ~~said first determination module comprising an~~
18 ~~illumination detector located on the same side of said movable polarizing code~~
19 ~~element as said first and second illumination detectors of said detector module~~; and

20   a second determination module coupled to receive said amplitude and said
21 quadrant and to determine an angular position of said movable polarizing code
22 element using said amplitude and said quadrant<u>, wherein the angular position is</u>
23 <u>determined using a respective equation associated with each of the quadrants.</u>

1   2.   (Previously presented)   The system of Claim 1, further comprising:

2   a controller module coupled to receive said angular position of said movable

3   polarizing code element, wherein said controller module uses said angular position to

4   control a movable device coupled with said movable polarizing code element.

1   3.   (Previously presented)   The system of Claim 2, wherein said

2   controller module is selected from the group consisting of a neural network controller,

3   a fuzzy logic controller, a proportional integral derivations controller, and a motor

4   controller.

1   4.   (Previously presented)   The system of Claim 1, wherein said second

2   direction is substantially perpendicular to said first direction.

1   5.   (Previously presented)   The system of Claim 4, wherein said first

2   illumination detector and said second illumination detector each comprise a

3   photodiode.

1   6.   (Currently amended)   The system of Claim 1, wherein said <u>first</u>

2   <u>and second concentric codes</u> ~~code is~~ <u>are</u> substantially opaque.

1   7.   (Currently amended)   The system of Claim 6, wherein said <u>first</u>

2   <u>and second concentric codes</u> ~~code is~~ <u>are</u> located within a segment of said second

3   portion of said movable polarizing code element.

1   8.   (Previously presented)   The system of Claim 1, wherein said first

2   determination module further comprises a second illumination detector located on the

3   same side of said movable polarizing code element as said first and second

4   illumination detectors of said detector module.

1   9.   (Currently amended)   A method for determining angular position

2   of a movable polarizing element, said method comprising:

3   illuminating said movable polarizing code element comprising a <u>first</u>

4   <u>concentric</u> code <u>extending over two of four quadrants of said movable polarizing code</u>

5   <u>element and a second concentric code extending over two of four quadrants of said</u>

6   <u>movable polarizing code segment, the first and second concentric codes juxtaposed</u>

7   <u>one another over one of the four quadrants of said movable polarizing code;</u>

8   detecting a first amplitude based on how much illumination passes through a

9   first portion of said movable polarizing code element and a first static polarizing filter

10   oriented in a first direction, said detecting said first amplitude comprises utilizing a

11   first photodiode;

12   detecting a second amplitude based on how much illumination passes through

13   said first portion of said movable polarizing code element and a second static

14   polarizing filter oriented in a second direction, said detecting said second amplitude

15   comprises utilizing a second photodiode;

16   determining a quadrant of said movable polarizing code element based on how

17   much illumination passes through a second portion of said movable polarizing code

18   element, said determining said quadrant comprises utilizing a third photodiode,

19   wherein said first, second, and third photodiodes are located on one side of said

20   movable polarizing code element; and

21   determining said angular position of said movable polarizing code element

22   using said first amplitude, second amplitude and said quadrant<u>, wherein using</u>

23   <u>comprises the application of a respective equation associated with each of the</u>

24   <u>quadrants.</u>

1   10.   (Previously presented)   The method as described in Claim 9, further

2   comprising:

3   utilizing said angular position to control movable apparatus coupled with said

4   movable polarizing code element.

1   11.   (Currently amended)   The method as described in Claim 9,

2   wherein said <u>first and second concentric codes</u> ~~code is~~ <u>are</u> substantially opaque.

1   12.   (Currently amended)   The method as described in Claim 11,

2 wherein said determining said quadrant comprises utilizing said substantially opaque

3 <u>first and second concentric codes</u> ~~code~~.

1   13.   (Previously presented)   The method as described in Claim 12,

2 wherein said determining said quadrant further comprises utilizing a fourth diode.

1   14.   (Previously presented)   The method as described in Claim 9,

2 wherein said first direction is substantially perpendicular to said second direction.

1   15.   (Previously presented)   The method as described in Claim 10,

2 wherein said utilizing said angular position to control said movable apparatus is

3 performed by a controller module.

1   16.   (Previously presented)   The method as described in Claim 9,

2 wherein said controller module is selected from the group consisting of a neural

3 network controller, a fuzzy logic controller, a proportional integral derivations

4 controller, and a motor controller.

1   17.   (Currently amended)   A system for determining angular position of

2 a movable polarizing code element, said system comprising:

3   means for illuminating said movable polarizing code element comprising a

4 <u>first concentric</u> code <u>extending over two of four quadrants of said movable polarizing</u>

5 <u>code element and a second concentric code extending over two of four quadrants of</u>

6 <u>said movable polarizing code segment, the first and second concentric codes</u>

7 <u>juxtaposed one another over one of the four quadrants of said movable polarizing</u>

8 <u>code</u>;

9   means for detecting a first amplitude based on how much illumination passes

10 through said first portion of said movable polarizing code element and a first static

11 polarizing filter oriented in a first direction;

12 means for detecting a second amplitude based on how much illumination
13 passes through said first portion of said movable polarizing code element and a
14 second static polarizing filter oriented in a second direction;

15 means for identifying a quadrant of said movable polarizing code element
16 based on how much illumination passes through a second portion of said movable
17 polarizing code element, said means for identifying said quadrant comprises an
18 illumination detector, ~~wherein said illumination detector, said means for detecting said~~
19 ~~first amplitude, and said means for detecting said second amplitude are located on one~~
20 ~~side of said movable polarizing code element~~; and

21 means for determining said angular position of said movable polarizing code
22 element using said first amplitude, second amplitude and said quadrant, <u>wherein using</u>
23 <u>comprises the application of a respective equation associated with each of the</u>
24 <u>quadrants.</u>

1 18. (Original) The system of Claim 17, further comprising:
2 means for utilizing said angular position to move an apparatus coupled with
3 said movable polarizing code element.

1 19. (Currently amended) The system of Claim 17, wherein said <u>first</u>
2 <u>and second concentric codes</u> ~~code is~~ <u>are</u> substantially opaque.

1 20. (Currently amended) The system of Claim 19, wherein said
2 ~~substantially~~ <u>first and second concentric codes</u> ~~opaque code~~ substantially obscures
3 illumination from being received by said illumination detector of said means for
4 identifying said quadrant.

1 21. (Previously presented) The system of Claim 17, wherein said first
2 direction is substantially perpendicular to said second direction.

1 22. (Previously presented) The system of Claim 17, wherein said means
2 for detecting said first amplitude comprises a photodiode covered by said first static
3 polarizing filter.